
INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
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SUGGESTIONS FOR TECHNIQUES IN REFORESTATION IN THE
INTERMOUNTAIN REGION 1/

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With recent passage of legislation by Congress for rehabilitation of unproductive forest land, many regions have started reforestation programs. The successful establishment of trees, either by artificial seeding or by planting, is not easy in the arid climate of the Intermountain region. Consequently, if the failures of early attempts in reforestation are to be avoided, every precaution must be observed and every instance, where experience has shown a certain course should be followed or shunned, must be recalled and observed.

Artificial Seeding

Artificial forest seeding has been carried out in the Western States, off and on, since 1905. Many of these early trials, and even later ones, were on a large scale and of such varying design that they produced erratic results. Consequently, this method of reforestation was regarded as inexpedient and unreliable.

Recent tests, however, have shown that certain aspects of seeding technique which were either overlooked or not given due weight previously have given encouraging results. While the following guides to technique are not conclusive, they should provide basic framework which can be added to rather than one that needs to be altered by further experimentation. For ponderosa pine on the granitic soils of central Idaho, the following points are fairly well established:

1. Seed and young seedlings must be protected from rodents. Broadcasting or sowing in spots without protection (screens or poison) is an appalling waste of seed except possibly when done on large burns, well inward from the borders, and immediately (i.e., before brush growth begins) after the fire.

1/ The information contained in this statement is drawn from the exploratory but soundly designed and carefully executed tests in seeding and planting by T. E. Maki, and extensive surveys and examinations by C. F. Korstian and F. S. Baker, formerly of the Station staff.

2. Competition from brush, grass, and weeds must be reduced by some means. Sowing immediately after a fire offers a partial solution but on old brush-covered burns some means must be found to reduce competition. Weedings may be necessary during the early years.
3. Fall sowing is better than spring sowing if complete protection is provided. Ordinarily untreated seed cannot be sown early enough in the spring in central Idaho to obtain satisfactory germination. Unless seed can be pretreated to induce very rapid germination, fall-sown seed holds a big advantage over spring-sown seed.
4. Hardware wire cloth (3-to-the-inch mesh) cones furnish sufficient protection against ordinary rodents and birds.
5. Young seedlings must be protected until stems are definitely suberized. Cones should be left in place until about the middle of August in the first growing season.
6. Grazing must be excluded during the first few years.
7. Only about 50 percent of clean and sound ponderosa pine seed can be expected to germinate under the natural conditions encountered in seeding. Allowances must be made for germination failure and drought losses. Fifteen seeds per spot is suggested as a conservative number.

Planting

Considerable experimental planting has been done in the Intermountain region dating from about 1915. The early plantings were confined to Utah and southeastern Idaho; latterly efforts have been directed towards work in central Idaho.

Within the Intermountain region, the greatest obstacle to successful planting is the dearth of available moisture in the root zone that invariably develops early in the growing season when the plant strives to become established. This, together with plant competition, has proved to be responsible for much mortality. Evidently no number of vigorous lateral roots will enable the plant to overcome a lack of sufficient moisture for root absorption and plant growth. Consequently, while some laterals are desirable, a healthy, well-developed taproot, some 12-15 inches long is much more useful and thus more important. It is to be further appreciated that since climate is one of the few uncontrollable factors, it is important to exercise every care in conforming to accepted standards of stock and procedures for lifting, transporting, and planting which are known to be suitable for all other factors involved. Some of these criteria are as follows:

1. Stock should be raised from a native seed source and if possible seed should be collected from trees of good vigor and good form. This is a silvical axiom all too often overlooked through expediency, "economy," or lack of facilities for collecting seed.

2. Planting sites, both general areas and spots within an area, should be critically selected. This means choosing planting areas where conditions are not unduly severe and choosing planting spots where shade and protection are provided by stumps, logs, rocks, living brush, or hummocks.

3. Plant at the proper time. In spring operations, plant immediately after snow recession and restrict planting to a short period thereafter. Refrain from fall planting unless autumnal rainfall is adequate to moisten the top 15 to 18 inches of soil.

4. Use husky stock. Stock should be heavily culled so that firm stems, taproots of not less than 12 inches, and a fair number of laterals characterize the plants. Stock of 2-1, 1-2, or 2-0 will probably fulfill these requirements.

5. Site preparation is necessary. This should take the form of reducing plant competition no matter what its kind. Where snag stands happen to be heavy, snag removal may be necessary, certainly desirable.

6. Exclude or restrict grazing during the early life of the plantation. Direct damages from trampling and indirect damage from sloughing of soil is real and considerable where grazing animals are present.

7. Sacrifice speed for care. The following rules should be applied from the time of nursery lifting to the planting of stock in the field: time the operations carefully; avoid root stripping, especially of the taproot; pack carefully to avoid overheating and drying out of the smaller roots, even in cloudy weather; exercise care in setting the plant vertically at the correct depth with roots spread out; and tamp sufficiently. Though these rules are familiar, unfortunately they are too often neglected in favor of establishing production rates and records, actually of little importance in the final analysis.

All of these criteria emphasize careful planning if any degree of success in reforestation is to be achieved under the severe climatic conditions of the Intermountain region.